SANKALCHAND PATEL UNIVERSITY
।। अथातो ज्ञानजिज्ञासा ।।

FACULTY OF COMPUTER SCIENCE
Master Of Computer Application (Sem-III)
In Effect from Academic Year 2023-24

Branch Name:	MCA
Program Code:	CS201
Course Title	Internet of Things (IoT)
Course Code	3CS2010306T
Pre-requisite Course:	Before start the IOT students can know about the python programming for practical purpose

Course Objective:

The objectives of the course are to:

- To research the foundational ideas of IoT
- To comprehend the functions of sensors in the Internet of Things
- To understand the various protocols used in IoT design
- Recognize how big data, cloud computing, and data analytics fit into an IoT system in general.
- Recognize the role that IoT plays in different industries.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
				Theory		Practical		
Lecture	Tutorial	Practical	Credit	University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	Total
4	-	-	4	60	40	-	-	100

Subject Contents			
Sr. No	**Topic**	**Total Hours**	**Weight (%)**
1	**Internet of Things (IoT):** Vision, Definition, Conceptual Framework, Architectural view, technology behind IoT, Sources of the IoT, M2M Communication, IoT Examples. Design Principles for Connected Devices: IoT/M2M systems layers and design standardization, communication technologies, data enrichment and consolidation, ease of designing and affordability	10	25
2	**Hardware for IoT:** Sensors, Digital sensors, actuators, radio frequency identification (RFID) technology, wireless sensor networks, participatory sensing technology. Embedded Platforms for IoT: Embedded computing basics, Overview of IOT supported Hardware platforms such as Arduino, NetArduino, Raspberry pi, Beagle Bone, Intel Galileo boards and ARM cortex.	12	25
3	**Network & Communication aspects in IoT:** Wireless Medium access issues, MAC protocol survey, Survey routing protocols, Sensor deployment & Node discovery, Data aggregation & dissemination. **Programming the Ardunio:** Ardunio Platform Boards Anatomy, Ardunio IDE, coding, using emulator, using libraries, additions in ardunio, programming the ardunio for IoT.	10	25
4	Challenges in IoT Design challenges: Development Challenges, Security Challenges, Other challenges IoT Applications: Smart Metering, E-health, City Automation, Automotive Applications, home automation, smart cards, communicating data with H/W units, mobiles, tablets, Designing of smart street lights in smart city.	12	25

List of References:

1. Olivier Hersent,DavidBoswarthick, Omar Elloumi"The Internet of Things key applications and protocols", willey
2. Jeeva Jose, Internet of Things, Khanna Publishing House
3. Michael Miller "The Internet of Things" by Pearson
4. Raj Kamal "INTERNET OF THINGS", McGraw-Hill, 1ST Edition, 2016
5. ArshdeepBahga, Vijay Madisetti "Internet of Things (A hands on approach)" 1ST edition, VPI publications,2014
6. Adrian McEwen,Hakin Cassimally "Designing the Internet of Things" Wiley India

Web Resources

1. https://geekflare.com/internet-of-things-iot-learning-resources
2. https://dev.to/josethz00/learning-iot-0-j84
3. https://github.com/microsoft/IoT-For-Beginners
4. https://letsfindcourse.com/best-iot-tutorials-and-courses

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	Demonstrate basic concepts, principles and challenges in IoT.	2 Understanding 3 Applying 4 Analyzing
CLO2	Illustrate functioning of hardware devices and sensors used for IoT.	1 Remembering 2 Understanding
CL03	Analyze network communication aspects and protocols used in IoT.	3 Applying 6 Creating
CLO4	Implement the multithreading concepts in python code.	3 Applying 4 Analyzing 5 Evaluate 6 Creating
CLO5	Apply IoT for developing real life applications using Ardunio programming.	3 Applying 4 Analyzing 5 Evaluate 6 Creating
CLO6	To develop IoT infrastructure for popular applications	5 Evaluate 6 Creating

Mapping of CLOs with POs & PSOs

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CLO1	H	H	L		M		L		L	L	H	M	H	H
CLO2	M	H		L	L		L		M	L	L	M	M	
CLO3	M	H	H	L	L		L		L	L	M	M		M
CLO4	M	H	M	L	L		L		L	L	M	M	H	
CLO5	M	H	H	L	L		L		L	L	M	M		H
CLO6	M	H	H	L	L		L		L	L	M	M		

H: High, M: Medium, L: Low